Lanner
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Embedded & Industrial Computing

Hardware Platforms for Embedded and Industrial Computing

LEC-7001
V1.0

User's Manual

Publication date:2014-07-17

About

Overview

Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

NOTE: This check mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.

WARNING: This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

The listed websites are links to the on-line product information and technical support.

Resource	Website
Lanner	http://www.lannerinc.com
Product Resources	http://www.lannerinc.com/download-center/

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Compliances

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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Chapter 1: Introduction

Thank you for choosing the LEC-7001. The LEC-7001 features Freescale i.MX 6 series processor. It has one Gigabit Ethernet LAN as well as an HDMI connector for high demand of Internet and digital signage applications. The super slim 140 x 26 x 110 mm chassis enables the unit to easily fit into the tightest spaces behind displays. This new signage player is an ideal solution for graphics intensive digital signage applications in retail, commerce, education, healthcare and automotive infotainment.

The following highlights the functionalities of the LEC-7001 system:

- Integrated Vivante GC graphic engine
- HDMI video output for displaying digital video contents
- One 10/100/1000 Mbps LAN
- 2 USB type A ports (one host USB and one USB On-The-Go switchable between master and slave with jumper selection)
- 1 console port via a 3-pin internal pin header
- One SD card reader for easy uploading multimedia contents
- Onboard 1G DDR3 SDRAM memory
- Onboard 4GB eMMC flash for storing boot image

The platform is supported by a Linux BSP as well as multiple third party operating systems and reference implementations that allow fast time to market and rapid prototyping. We include development instructions in the BSP folder in the Driver and User Manual CD. More information can be found at http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=i.MX6Q. Note that some documentation and software may require you to register first.

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System Specification

Processor Options		Freescale™ i.MX 6 series processor
Chipset		N/A
BIOS		N/A
Memory	Technology	DDR3 1066MHz
	Max. Capacity	LEC-7001A/B: Onboard 1 GB, LEC-7001C: Onboard 512 MB
USB		1 x Type A USB 2.0 connector (Host/OTG), 1 x Type A USB 2.0 connector (USB Host)
Expansion Bus		N/A
OS Support		Android 4.2, Ubuntu from Freescale, basic Linux from Lanner/Freescale (Subject to change)
Storage	HDD/SSD Support	N/A
	Expansion	1 x SD card socket
Networking	LAN	1x10/100/1000Mbps, Autosensing,RJ-45
	Controller	Atheros 8031
Display	Graphics Controller	Built in Vivante GC
	Display Interface	1 x HDMI (1920x1080P)
LED Indicator		1 x Green-color for Power-on status
Physical Characteristics	Housing	SECC
	Weight	0.5 kg
	Dimensions (WxHxD)	140 x 26 x 110mm
	Mounting Options	Wall mount
Environment	Operation Temperature	-20~45°C (subject to change)
	Storage Temperature	-20~55°C
	Ambient Relative Humidity (non-condensing)	5 to 95% (non-condensing)
Power	Input Voltage	+5V/12V DC
	Power Consumption	TBD
	Connector	DC jack with lock
	AC Adapter	+12V@3A; +5V/5A
Standard and Regulation	EMC	CE/FCC
	Green Product	RoHS
Reliability	Alter tool	Built-in RTC (real-time clock) with battery lithium backup
	Watchdog Timer	Watchdog Timer 1~255 level time interval system reset, software programmable

Chapter 1

Ordering Information

LEC-7001A	Fanless Industrial PC with freescale™ ARM Cortex-A9 MPcore i.MX 6 Dual processor, 1 GB Memory
LEC-7001B	Fanless Industrial PC with freescale™ ARM Cortex-A9 MPcore i.MX 6 Quad processor, 1 GB Memory
LEC-7001C	Fanless Industrial PC with freescale™ ARM Cortex-A9 MPcore i.MX 6 Solo processor, 512 MB Memory

Package Contents

Your package contains the following items:

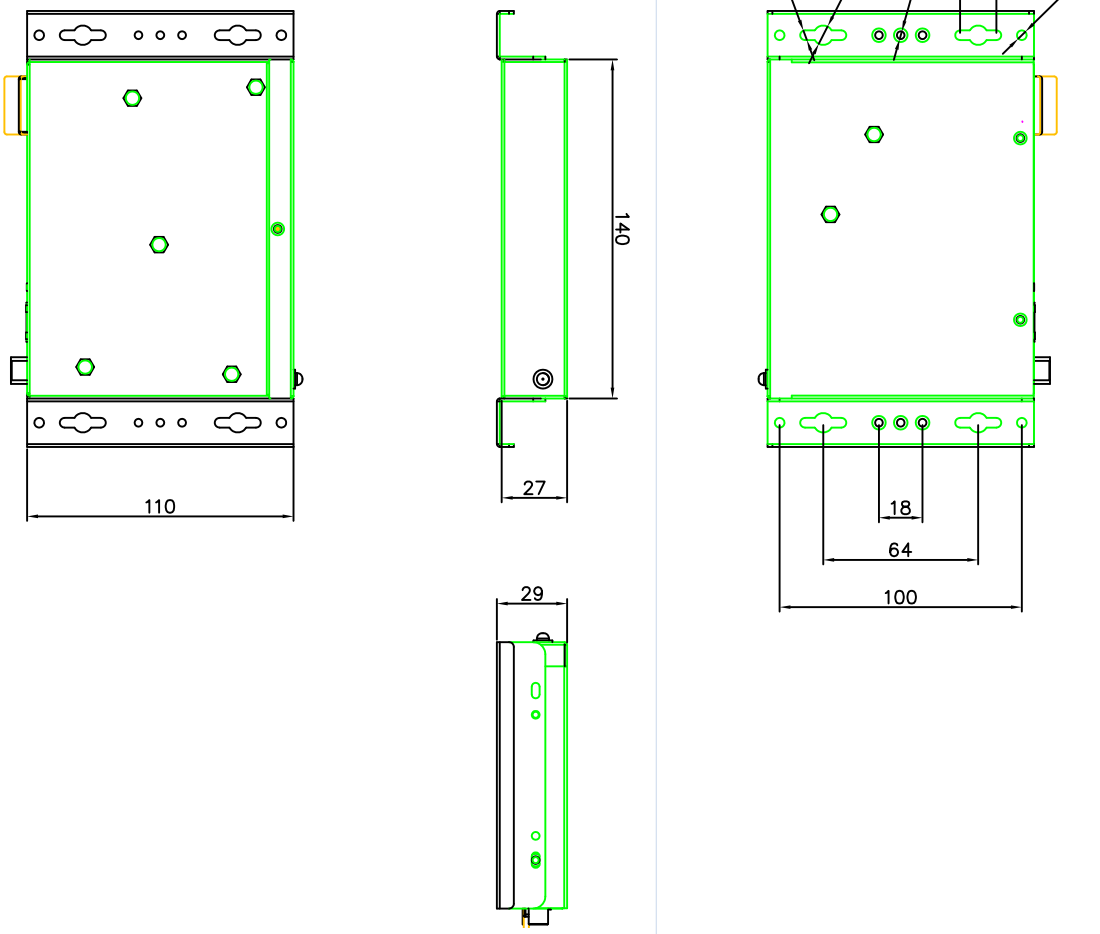
- LEC-7001 Fanless Embedded System
- Drivers and User's Manual CD (CD S09OADA38H100)
- DC Jack with Lock (0P0W036122031)

Chapter 2:
System Components

System Drawing

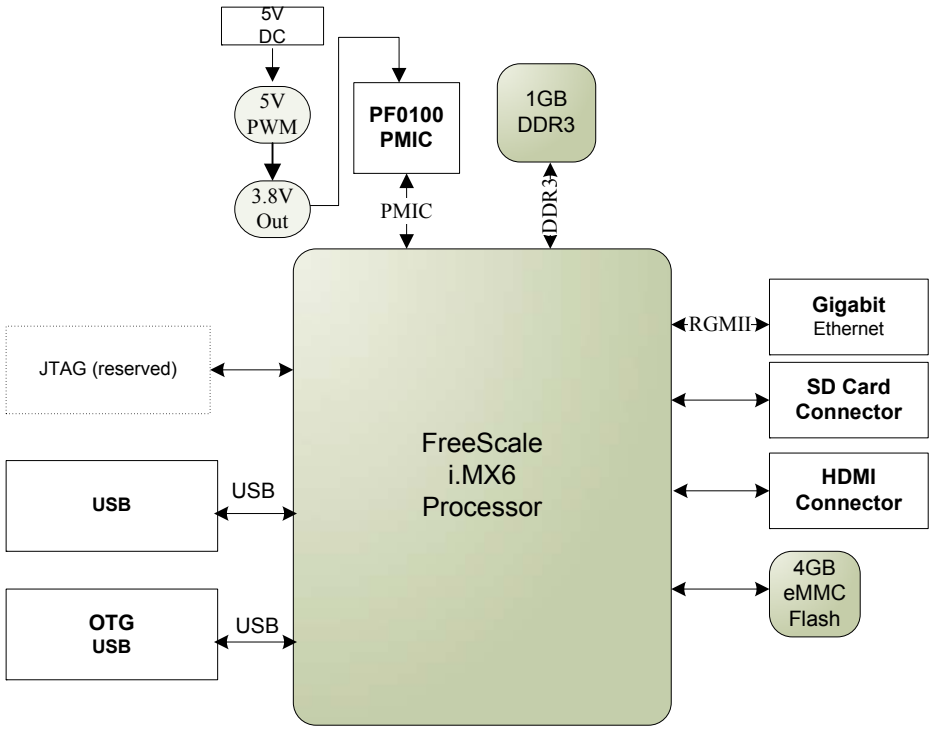
Mechanical dimensions of the LEC-7001

Unit: mm



Block Diagram

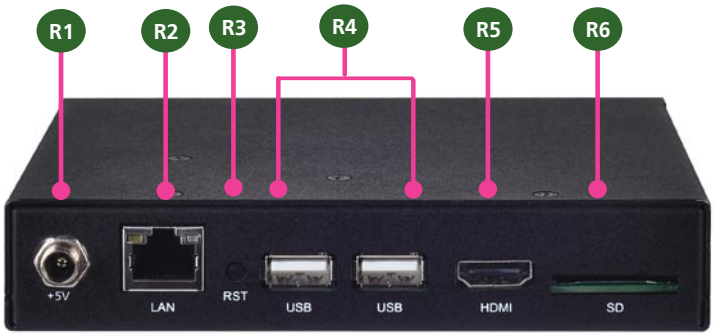
The block diagram depicts the relationships among the interfaces and modules on the motherboard.



Front Components

Component	Description	Pin Definition Reference
F1 Power-on LED (green)	LED On: power-on LED Off: power-off	

Rear Components

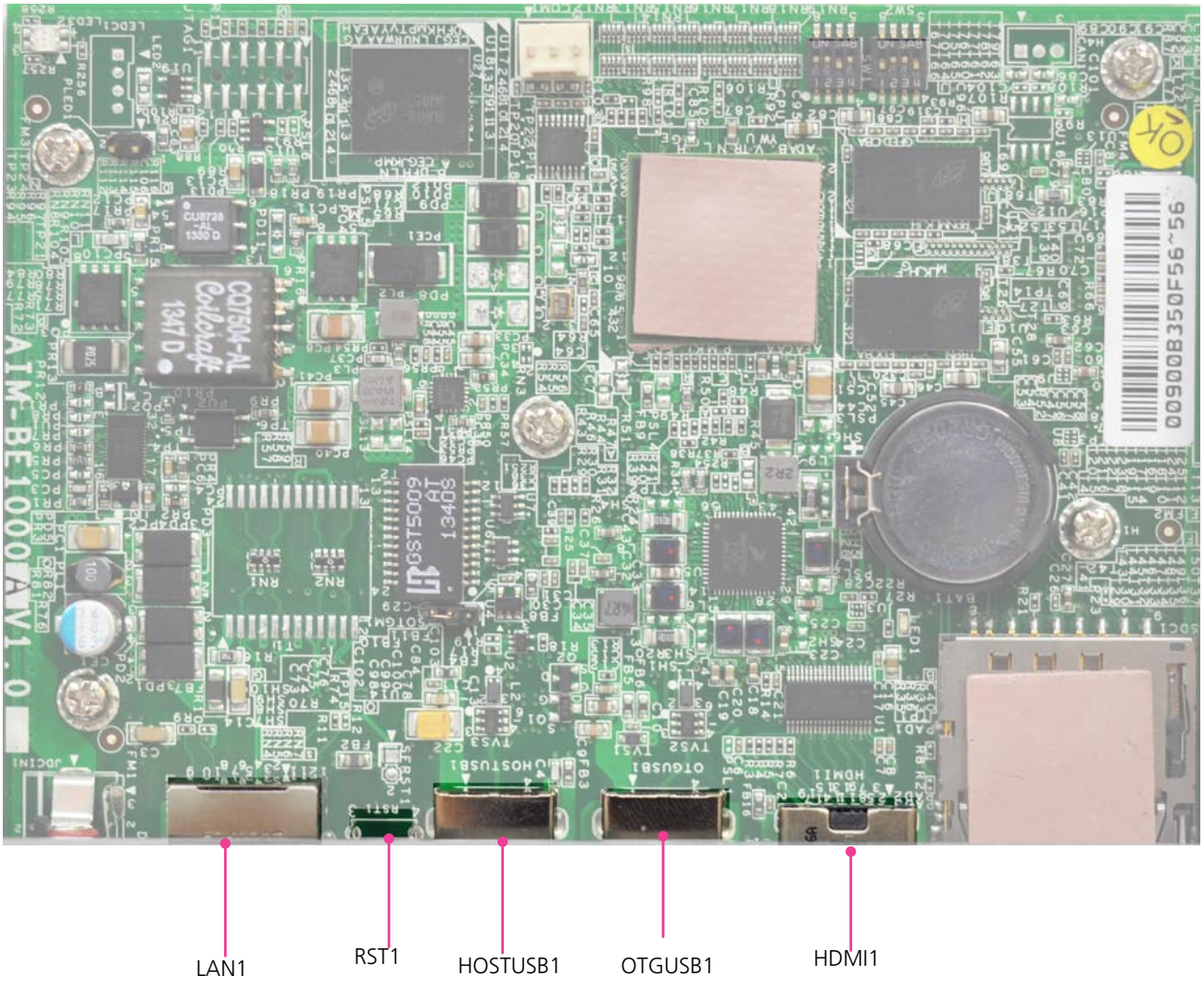


Component	Description	Pin Definition Reference
R1 DC Jack with Lock	An external DC power input which requires 5V or 12V power	
R2 LAN	1x 10/100/1000Mbps Ethernet which is provided by Atheros AR8031 LAN LED indications: Link/active LED (yellow): On – Connected; Flash – Transmission/receiving Speed LED (green/yellow): Yellow – 1000Mbps; Green – 100Mbps; Off – 10Mbps	LAN1 on page 12
R3 Reset	Reset switch	RST1 on page 12
R4 Two USB 2.0 Ports	1x Type A USB 2.0 ports connectors (OTG) 1x Type A USB 2.0 ports connectors (USB Host)	HOSTUSB1, OTGUSB1 on page 12
R5 HDMI	The HDMI (High-Definition Multimedia Interface) port can support up to 1920x1080 resolution.	HDMI1 on page 12
R6 SD Reader	One SD Card Reader. The system can also boot from the SD device with a jumper selection on the system board.	

Chapter 3: Board Layout

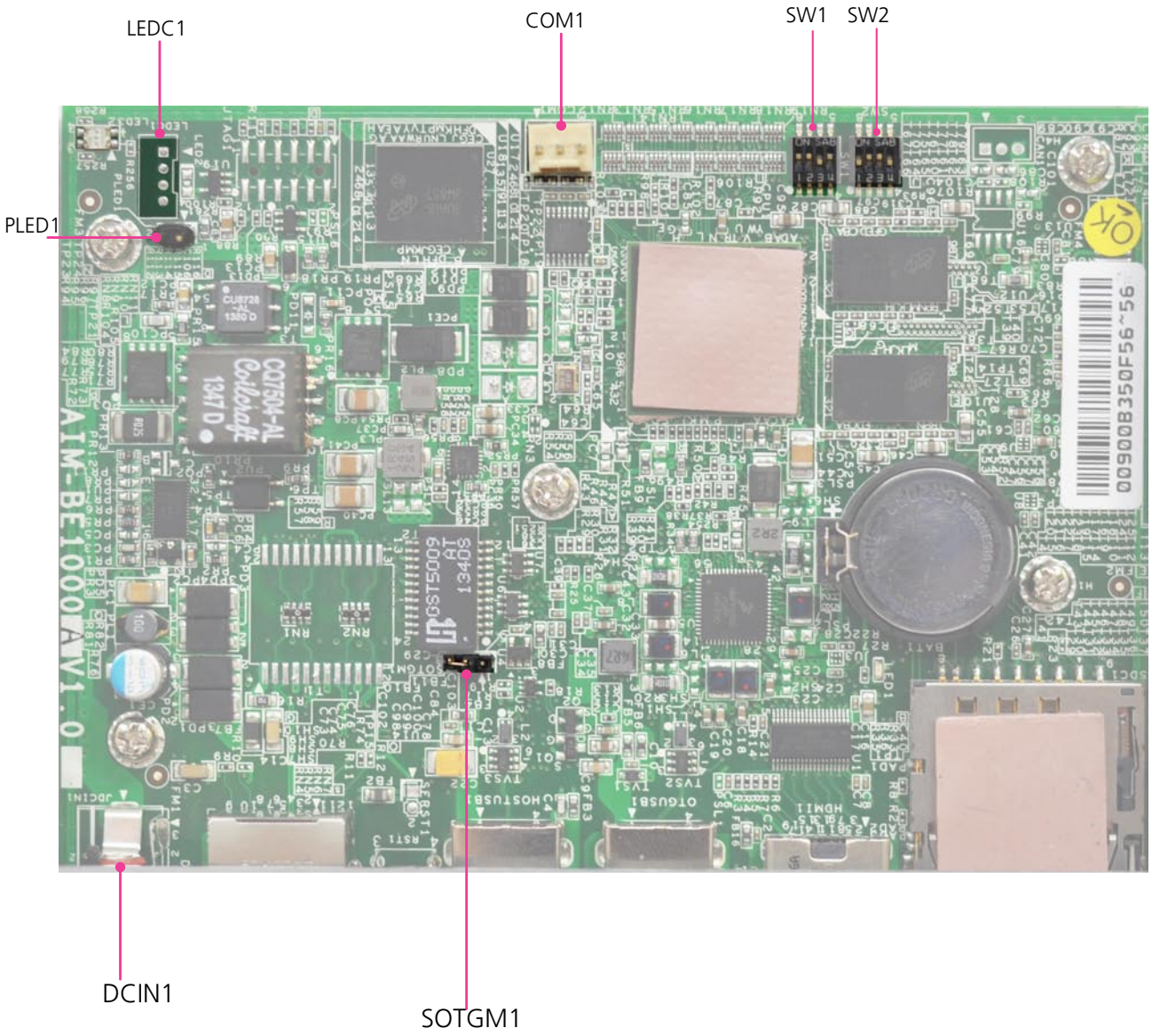
External Connectors

The following picture highlights the location of the external ports. Refer to the table 3.1 Connector List for more details.



Internal Connectors and Jumpers

The following picture highlights the location of internal connectors and jumpers. Refer to the table 3.1 Connector List for more details.



Connectors and Jumpers List

The tables below list the function of each of the board jumpers and connectors by labels shown in the above section. The next section in this chapter gives pin definitions and instructions on setting jumpers.

Table 3.1 Connector List for **LEB-7001** Board

Labels	**Function**	**Pin Definition Reference Page**
COM1	UART for Console	P12
DCIN1	+12V DC-in Power	P13
HDMI1	High-Definition Multimedia Interface Port	P12
HOSTUSB1	PS/2 Keyboard & Mouse Connector	P12
LAN1	Ethernet LAN Ports	P12
LEDC1	Programmable Status LED	P12
OTGUSB1	USB On-The-Go	P12
PLED1	Power LED	P13
RST1	A Reset Button	P12
SOTGM1	OTGUSB1 Port Mode Selection	P12
SW1/SW2	Boot Device Selection	P12

Jumper Settings

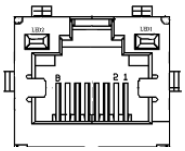
Software Reset Button (RST1)

Pin No.	Panel Voltage
1	GND
2	SRSET_IN#
3	GND
4	GND

UART for Console (COM1): An UART port for serial communications

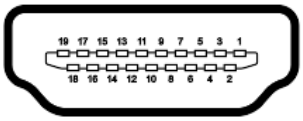
Pin No.	Panel Voltage
1	COM1_RX
2	GND
3	COM_TX

RJ-45 with Ethernet LAN Port (LAN1): It is provided by Atheros AR8031 which complies fully to 10/100/1000 BASE-T IEEE 802.3 and supports IEEE 802.3az. It is also capable of Wake-on-LAN (WoL).



Pin No.	Signal	
	Fast Ethernet	Gigabit Ethernet
1	TX+	MD0+
2	TX-	MD0-
3	RX+	MD1+
4	T45	MD2+
5	T45	MD2-
6	RX-	MD1-
7	T78	MD3+
8	T78	MD3-
11	Speed_10-/100-/1000+	
12	Speed_10+/100+/1000-	
13	Link+/ACT-	
14	Link-/ACT+	

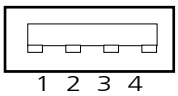
High-Definition Multimedia Interface (HDMI1): High-Definition Multimedia Interface V1.4



Pin No.	Description	Pin No.	Description
1	DATA2+	2	GND
3	DATA2-	4	DATA1+
5	GND	6	DATA1-
7	DATA0+	8	GND
9	DATA0-	10	CLK+
11	GND	12	CLK-
13	N.C	14	N.C
15	DDC CLK	16	DDC DAT
17	GND	18	HDMI_VCC
19	HPD		

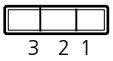
HOST USB Connector (HOSTUSB1)

On-The-Go USB Connector (OTGUSB1): The USB OTG can perform both master and slave roles in USB communications.



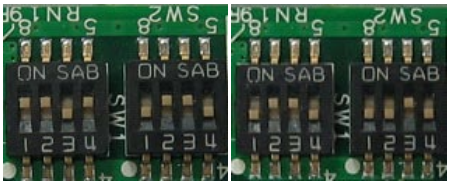
Pin No.	Panel Voltage
1	+5V
2	USB-
3	USB+
4	Ground

OTGUSB1 Mode Selection (SOTGM1): It selects the OTGUSB1 to be either the host (master) or the device (slave).



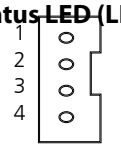
Pin No.	Function
2-3	Host (default)
1-2	Device

System Boot Device Selection (SW1, SW2): It selects between the onboard eMMC or the SD card to be the boot device.



Boot Device Selection SD4== eMMC memory SD3== SD card							
SW1				SW2			
1	2	3	4	1	2	3	4
1	2	3	4	5	6	7	8
11=SD4 boot		1X=4-bit 01=8-bit		X110 = MMC/eMMC Boot			
01=SD3 boot		0X=1-bit 1X=4-bit		X010 = SD/eSD Boot			
0	X	X	X	0100=SATA Boot			
0	0	0	0	1100=Download Mode			
Where x: don't care							

Programmable Status LED (LEDC1)



Pin No.	Panel Voltage
1	GND
2	STUS_LED1 (Orange)
3	STUS_LED3 (Green)
4	STUS_LED2 (Red)

Power LED (PLED1)

Pin No.	Panel Voltage
1	+3.3V
2	GND

+12V DC-IN (DCIN1)

Pin No.	Panel Voltage
1	+12V
2	GND
3	GND

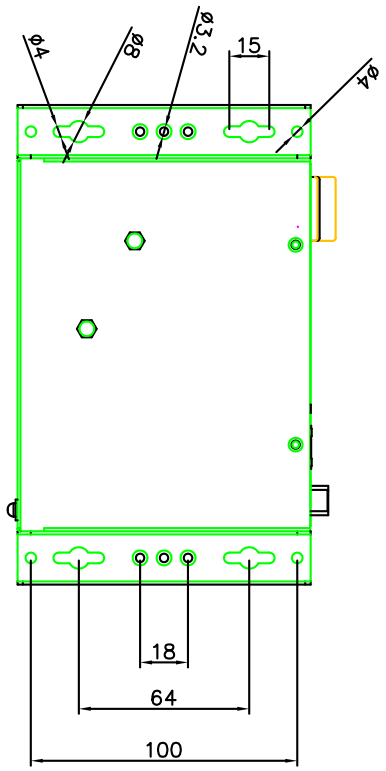
Chapter 4: Mounting the Appliance

Wall Mounting

The product ships with wall mounting kit. To mount your product on the wall, follow the instructions below:

1. First make a hole for the anchor in the surface on the wall.
2. Then press the anchor into the hole until it is flush with the surface. You may need a hammer to tap the wall anchor.
3. Use a screwdriver to screw the threaded screw into the plastic anchor.
4. Attach the wall mounting bracket to the back of the device, securing it in place with four of the flat-head screws provided.
5. Hang the device on the wall.

Unit: mm



Appendix A: Terms and Conditions

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:

- Improper or inadequate maintenance by the customer
- Unauthorized modification, misuse, or reversed engineering of the product.
- Operation outside of the environmental specifications for the product.

RMA Service

Requesting a RMA#

6. To obtain a RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
7. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
8. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
9. Mark the RMA# clearly on the box.

Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

Appendix A

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:	Reasons to Return: □ Repair(Please include failure details) □ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____	
Shipping by: □ Air Freight □ Sea □ Express_____ □ Others:_____	

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

Request Party

Authorized Signature / Date

Confirmed By Supplier

Authorized Signature / Date